THE

Journal of the Society of Arts,

AND OF

THE INSTITUTIONS IN UNION.

110TH SESSION.] FRIDAY, JANUARY 8, 1864. [No. 581. VOL. XII.

Announcements by the Council.

REPORTS OF THE JURIES.

The complete volume of the Reports of the Juries on the Exhibition of 1862 is now ready, and is in course of issue to subscribers.

PRIZES TO ART-WORKMEN.

The works rewarded by the Society of Arts, and for which prizes have been given, have been placed, by permission of the Lords of the Committee of Council on Education, in the South Kensington Museum, and will be found in the Gallery of the Iron Museum, at the entrance to the Sheepshanks Gallery.

CANTOR LECTURES.

Courses of Lectures on the following subjects will be delivered during the Session :—

The Operation of the Present Laws of Naval Warfare on International Commerce. By G. W. HASTINGS, Esq., Barrister-at-Law.

Fine Arts Applied to Industry. By W. BURGES, Esq.

Chemistry Applied to the Arts. By Dr. F. CRACE CALVERT, F.R.S.

The third and fourth lectures of Mr. Hastings' course will be delivered on Mondays, the 25th January and 1st February, at 8 o'clock; the subjects will be as follows :—

Contraband; its Nature and Usages.

Capture of Private Property at Sea; present State of the Law as modified by the Declaration of Paris; Arguments for and against its Continuance.

The Foreign Enlistment Act; its Operation on Commerce.

The following is a syllabus of Mr. Burges's Lectures:—

FEB. 8.—LECTURE I. INTRODUCTORY:—What is an art manufacture? Advancing state of English manufactures in an art point of view. Much owing to Government Schools of Art. Impediments to further progress:—1. Want of a distinctive architecture in the 19th century fatal to art generally. 2. Want of a good costume fatal to colour. 3. Want of sufficient teaching of the figure fatal to art in detail.—Hints for the advancement of Art applied to Industry.—Design of following lectures:—1. To take one or two phases of some particular industry in past times. 2. To compare them with our own phase of the same industry. 3. To offer suggestions for our future improvement.

FEB. 15.—LECTURE II. — *Glass.*—Antique glass, Venetian glass, modern glass (Powell, Chance, &c.); Mediæval stained glass; modern ditto; Mediæval enamels; modern ditto; (Legoste of Paris.)

FEB. 22.—LECTURE III.—*Pottery.*—Etruscan vases (Wedgwood); Italian majolica (Minton); Sèvres china; modern biscuit.

FEB. 29.—LECTURE IV.—*Iron and Brass.*—Antique bronzes; Mediæval ditto; modern French bronzes (Barbédienne); Mediæval dinanderie; modern ditto (Hardman, Hart, &c.); Mediæval and Renaissance wrought iron; modern ditto; cast iron.

MAR. 7.—LECTURE V.—*Gold and Silver.*—Antique and Mediæval plate; modern ditto (Elkington); Antique and Mediæval jewellery; modern ditto; Antique and Mediæval coinage; modern ditto.

MAR. 14.—LECTURE VI.—*Furniture.*—Mediæval furniture, oak and painted; Renaissance; 16th and 17th centuries; modern.

MAR. 21.—LECTURE VII.—The Weaver's art; Mediæval, Eastern, modern.

The Lectures will begin on each evening at 8 o'clock.

The Christmas subscriptions are now due, and should be forwarded by cheque or post-office order, made payable to the Financial Officer, Samuel Thomas Davenport. All cheques and post-office orders should be crossed through Messrs. Coutts and Co.

Proceedings of Institutions.

BANBRIDGE LITERARY AND MUTUAL IMPROVEMENT SOCIETY.—The tenth anniversary conversazione of this Institution was held on Wednesday evening, the 16th December, in the church school-rooms. GEORGE GERALD TYRRELL, Esq., presided, and delivered an introductory address. The honorary secretary was then requested to read the report of the Executive Committee, which showed that the number of members is still increasing, and detailed the varied and extensive operations of the society during the past year. In consequence of the duties of the treasurer's and secretary's offices having become so onerous, a paid assistant officer was appointed last spring to discharge a combination of these duties. The treasurer read the financial statement, exhibiting a small credit balance. The chairman commented at length on the report and financial statement, and, as a pecuniary loss had been sustained on last year's lecture engagements, he generously undertook to draw a cheque in favour of the treasurer to supply the deficit, £5 13s. 9d. He expressed his regret that his predecessor, George Barry, Esq., was prevented from being present at this social reunion, to receive in person the society's address and presentation, which consisted of a silver salver, bearing an inscription. The entertainment was intermixed with musical performances.

FAVERSHAM INSTITUTE.—The monthly journal of this Institute for December, announces local examinations, for members under the age of 16, to take place on the 12th, 13th, and 14th of January. The subjects are arithmetic, English grammar and composition, English history, reading, and writing; and there are prizes of £1, 10s., and 5s. offered in each. To every member who may obtain a first-class certificate in the Society of Arts examinations, a prize of the value of 20s. will be awarded by the committee of the Institute. A lecture was delivered on Wednesday, Dec. the 16th, by Robert Hunt, Esq., F.R.S., on "The Influence of Light on Life." Subscriptions in aid of a fund for erecting a wall and fence in front of the Institute are being collected. Two concerts are announced. The Singing Class has been dissolved, at the request of its members, in order that a Musical Society might be established in connection with the Institute. The financial statement, from September 7th to November 17th, shows that the total receipts number £135 17s. 0½d., and that there is a balance in the treasurer's hands of £8 15s. Historical and geographical questions are given in this journal, answers to which are solicited from members under the age of 18. A book, of the value of ten shillings, is awarded to the member (under the age of 18) who shall furnish the greatest number of correct answers to the geographical questions contained in six numbers of the monthly journal; and to the member furnishing the next to the greatest number of correct answers, a book of the value of six shillings will be presented. The 2nd prize will not, however, be given, unless there be six competitors; and no prize will be awarded, unless there be three competitors.

MOSSLEY MECHANICS' INSTITUTION.—The Committee have resolved to afford to the other Institutions the interchange of privileges specified in the conditions of Union.

NEWCASTLE CHURCH OF ENGLAND INSTITUTE.—A lecture was delivered here on the 7th December, by D. Zenner, Esq., on the "Properties of Matter." There was a good attendance, and the chair was taken by the Rev. W. R. Burnett.

WESTMINSTER WORKING MEN'S CLUB AND READING ROOMS, DUCK-LANE.—The 3rd anniversary meeting was held on Friday evening, the 11th December. Alderman Sir R. W. Carden presided, supported by Joseph Payne, Esq. (Assistant Judge), Rev. T. Wright, M.A., J. M. Clabon, Esq., E. Fry, Esq., &c. The chairman expressed his thanks to Miss Adeline Cooper for having invited him to preside for the third time at this prosperous institution, which must be called not only the parent of, but the model for, all similar efforts. So convinced was he of the importance of abundance of such clubs that he was about establishing one in Marylebone, towards which he would give £100. The report was read by Mr. Edward Stephens, Secretary of the Club, and a member of the Working Men's Committee. It stated that they had enjoyed a course of uninterrupted success. The simple plan of the foundress of the Institution, of combining the social element with the intellectual, and placing the entire management in the hands of a committee of working men, chosen by and from a body of the members, has proved so acceptable and popular, that the building has required to be enlarged twice since it was first opened three years since. It now consists of a social club-room for coffee, smoking, chess and draught playing, newspapers, &c., a library, kitchen, lavatory, &c., on the ground floor, and class reading and lecture rooms upstairs. The cost of the additional ground and enlargement, with fittings, &c., is £580, towards which the Marquis of Westminster has given £100, but £190 is still required. There are above 500 members, 148 new members having joined since the Club re-opened a month since; the subscription is one halfpenny a week, and the average attendance 130 nightly. There are 12 simple rules, which are strictly enforced by the Working Men's Committee, and the greatest order has been preserved, while there has not been one defaulter from any of the societies, or one book lost from the library, which has between 400 and 500 volumes. The reading, writing, and ciphering classes are held three times a week; there are also French, singing, and Bible classes. The Penny Bank has received £140 in deposits, the Enrolled Labour Society has granted to members 135 loans, representing a sum of £321, although the capital is but £95, divided among forty-nine shareholders; the Barrow Club has supplied nine barrows of £2 10s. each, to as many members (costermongers), instead of their paying for years simply for the hire of one; the Sick Society has assisted fourteen members with sums varying from 10s. to 20s. The Cricket Club numbers fourteen members, who practise in Battersea-park. All these societies had been managed entirely by working men's committees—Miss Adeline Cooper acting as treasurer. A Labour Registry had been opened, and the attention of employers was solicited, as steady workmen would there be met with. Two models of the club, "As it Was," and "As it Is," executed by a member, were shown. Fourteen lectures, on a great variety of subjects, many of them illustrated with diagrams, pictures, and chemical experiments, had been delivered during the year, gratuitously, by clergymen and gentlemen, and numerously attended. Applications for the rules and plan of management had been received from nearly a dozen places, and deputations from this club had attended, by invitation, at several meetings for the formation of Working Men's Clubs. Several addresses followed the reading of the report, Mr. Clabon incidentally referring to an interview he had with the Prince Consort, on the necessity of opening some places of recreation for the working classes. The proceedings were closed by singing the anthem, "God save the Poor."

THE RESOURCES OF GREECE.

The following is an abridgment of a communication made by a correspondent of the *Daily News*, and is calculated to afford a practical insight into the general condition of rural affairs in Greece:—

The favoured soil of Greece, owing to its geological character and climate, offers a greater variety of elements of prosperity than almost any other country. True, Egypt may be better for corn and cotton, Syria for tobacco, Spain for wines, Russia for flax, but Greece has soil equal to Egypt, she has land similar to the best tobacco ground of Syria; wines have been produced there as fine as those of Spain, and flax equal to that of Russia.

Viewed under these aspects, I need not point out that no branch of development can more seriously affect the highest interests, both present and future, of Greece and the Greeks; while none, unfortunately, has been hitherto more utterly and systematically neglected, both by the Government and the people.

I am about to describe an estate situated twenty miles due north of Athens, upon which is supposed to have stood the ancient Delphinium. It lies in a ring fence, with at least nine miles of sea frontage on the beautiful strip of sea between Attica and Eubœa, on which float steamers to Thessaly and Constantinople, &c.; and as there are still remains of the ancient port of Oropus, the produce of the estate may be easily shipped to any part of the world. On the south it extends to a distance of about eight miles, the ground rising gradually in an irregular succession of plateaux to an elevation of nearly one thousand feet, the upper part of which is covered with timber—fir, oak, &c. Here and there may be seen acres covered with *Prunus semperflorens*, almond, *Prunus acida*, vine, fig, *Celtis Orientalis*, the arbutus, the myrtle, the wild lavender, and many other aromatic and flowering shrubs.

The property consists of about 25,000 English acres. Of these there are 3,000 acres, near the sea, of rich

alluvial soil, many feet deep, once famed as the ancient plain of Tanagra. Higher up are 2,000 acres of good sound calcareous soil. Then about 7,000 acres of land fit for cultivation, but which have never been touched; 8,000 are under timber, being principally fir trees; 4,000 acres of rough, wild land, although of little value, would serve for grazing goats, but not for sheep, as the bushes would tear off their wool. In addition there are about 1,000 acres of waste, including water and the beds of rivers.

On this estate fine wheat could be grown on a surface of 3,000 acres; barley on at least 6,000 acres; beans or peas on 4,000; Indian corn on 5,000 acres; tobacco on 6,000 acres. Of these last, however, perhaps only 2,000 would produce the best quality of tobacco, the remaining 2,000 giving larger crops, but of an inferior kind. Rice could be grown on almost any of the ploughed lands, there being a species that will grow on the higher ground without water. The usual method of growing rice on the low lands, under water, has been so generally found to breed fever, that it has been rightly prohibited, except in certain districts. Sesame, a most productive small seed, exported principally to France, where a valuable oil is extracted from it, can by good management be grown after a crop of wheat, and will produce the same return, thereby bringing in one year as much as £15 to £16 per acre. Oats will grow on most of the arable land, but they never do very well, and are almost unknown, all the horses being fed on barley and straw. About 1,500 acres of land on the property are admirably adapted for the vine, owing to aspect, soil, and elevation. The richer lands produce more grapes, but they are not so well suited for making good wines. If intended for sale green, or to be made into raisins, they answer very well, as the vine does not require any water during the summer; it is specially adapted to Greece; and it is very important that more attention should be given to its extensive cultivation. On the island of Santorene, where the best wine is made, the land is in a great measure composed of pumice stone, volcanic glass, and scoria. The way the vines are trained there is worthy of note, as being so very ingenious and uncommon. At about twelve inches from the surface they are twisted into the form of a basket; this, being formed of the old wood, which is always suffered to remain, saves any trouble or expense of stakes, and the grapes grow inside and around these baskets, well off the ground. The cultivation of the vine, if the disease will only keep off, ought to engage the special attention of the owners of the volcanic and limestone soils of Greece, particularly those that cannot be artificially watered, as by careful management £4 to £5 per acre can be realised. In the Lebanon the grapes are, for the most part, turned into a kind of treacle. The land is ploughed between the vines, which lie flat on the ground, and corn is grown between them. I found, after a most careful investigation, that the average return per acre is not less than £7 to £8.

The currant vine would grow, but I believe would not succeed; for it is strange, but true, that it will only grow to a profit in certain districts on the south of the Gulf of Corinth and parts of the Ionian Islands. It has been tried repeatedly elsewhere, but has invariably failed. The plantations have been extended considerably in their own localities, but at no great distance removed from them.

Cotton would grow on the greater part of the ground suited to other crops, if care was taken to select the seed suited to the different soils. The production of cotton in Greece may pay as long the present high prices are maintained; but I see no chance at present of any of the coasts of the Mediterranean, except Egypt, being able to compete with either America or India, unless it be in the cotton of the Sea Island character. The soil is suitable, the climate to a certain extent not ill adapted to it; but the drawbacks surpass the advantages, except at the present prices. Thus in Greece there is neither capital nor labour sufficient to produce any very large quantity. The same objection applies to Algeria, the best cotton districts moreover being too feverish there to permit their lack of population being easily supplied by colonists. In addition to this there exist various other impediments not enumerated in the Utopian programmes of cotton companies, or either military or civil governors. In Morocco, where I have seen the finest cotton produced, the disturbed political condition of the country, and its attendant risk to life and property, are not likely, at any rate for the present, to enable it to compete with such countries as Egypt. It must be remembered likewise that there is not an unlimited demand for the long staple, silky cotton, which cannot be sold in Manchester at less than double the price of the American short staple. Moreover, the autumn rains, which at times begin rather early in these parts, and continue more or less throughout the winter, varied by slight frosts, are a serious disadvantage when compared to Egypt for instance, where rain being scarcely known, and frost never, crop after crop is picked from the plants from September till February.

My advice, therefore, to cultivators of the soil in these regions would be, to turn their attention to other produce, which in the long run will pay better, and not exhaust the land, as cotton has been proved to do; no trifling consideration when we see thousands of acres in America already abandoned in consequence of being worn out by cotton cultivation. No doubt the cotton return has been great, but under the system recommended above, it would be as large, while at the expiration of twenty years, when the cotton planters' property has become worthless, the other proprietor would be in possession of land ten times its former value, although of course I would not exclude the growth of cotton in a proper rotation, if the demand renders it desirable.

Olives grow wild in many parts of the estate, and only want grafting to produce fine fruit to the value of many hundreds a year. Between the Dardanelles and Smyrna there is a wild uncultivated tract of country, covered with olives. Some few years ago it was taken at an almost nominal rent, and I heard lately that it is now bringing in over £2,000 a year, simply by grafting.

From the little attention that has been paid to the manufacture of oil in Greece it fetches a very low price in comparison to that of France and Italy; but I find that this is entirely due to want of care and skill in the preparation. They do not even separate the bad from the good olives, and are most negligent in refining the oil. Where proper attention was given to it by a Swiss gentleman on his own estate, I saw oil that had been valued as high by competent judges as the best French or Italian.

Oranges and lemons grow most admirably with the least care, and the produce is no insignificant matter even in a well-cultivated garden; a fact of which the one belonging to the Governor at Malta may serve as proof, the oranges out of it having fetched about £400 last year. The garden at Oropo is nearly the same size, and the soil much better; even allowing that the Malta oranges are more valuable, still good returns may be obtained. The produce of the garden consists of pomegranates, almonds, figs, grapes, and various other fruit trees, also very fine melons and vegetables. Apples do not do so well as pears, and the peaches and nectarines are generally hard, and have not much flavour, but they could be much changed and improved by cultivation.

The prickly pear (*Cactus opuntia*) grows 10 to 15 feet high, and produces an enormous amount of vegetable matter, but not the least use is made of this plant except as a fence, for which it is particularly well adapted, while its fruit is in some places eaten by the lower orders. The total disregard of this fleshy, massive leaf as food for cattle has always struck me as unaccountable, and it is only recently, upon investigating the matter narrowly, that I have discovered that it forms an excellent substitute for green food for cows, with a moderate admixture of hay, straw, or grain, the milk they produce while eating it being quite as good as when they are fed on the

best grass. This I can affirm, having for many weeks used no other. This may seem a matter of slight importance, but those who reflect that it covers acres of the poorest and driest soil in all these southern latitudes, where from the want of water no ordinary pasture can be made to grow, will hardly be disposed to undervalue it.

Thus, throughout Greece, no less than Dalmatia, and in a great portion of Sicily, Turkey, and Algeria, where the dearth of pasturage reduces the inhabitants in so many places to the exclusive use of goats' and sheep's milk, the simple exploitation of this plant, which only asks to be let run wild to multiply and thrive, would give the means of supplying Athens, &c., with good cow's milk and butter, no small consideration where this latter, as in the Levant, is reduced to an expensive luxury imported from Lombardy and England.

It should not be overlooked either that an abundant supply of milk is more conducive to the advancement and well-being of a country than many may suppose. There is not a good farmer who will not tell you that every animal on the farm will be nearly doubled in value by the liberal supply of good milk. Nor can it be otherwise, since it contains every element for the nourishment of adult life. What would the Smithfield Cattle Show, or the stockyard of our Royal Agricultural Society be, if the animals exhibited had been stinted in milk? To those who have any doubt as to the importance of milk as an article of food, I beg to state that most prize animals have drank the milk of perhaps two cows for a whole year or more. There is a race of horses in the desert capable of complishing the most extraordinary journeys, whose sole food is camels' milk.

To return to the estate. Lucern and all kinds of clover would grow most luxuriantly over five thousand acres, and produce a most valuable food for all the stock during the winter months, either green or made into hay. In Egypt the whole live stock of the country is tethered, from October till March, on lucern, and consume nothing else.

Among the trees, the mulberry, for silk worms, is, perhaps, the most important; it grows very fast, and beautiful silk is produced. Another point worthy of note, but which is little known in Greece, is, that the leaves, if not wanted for the worms, make an admirable food for cattle, which are very fond of them.

The pine trees on the upper part of the estate have been so badly treated and neglected that they are of little value. The owner, wishing to extract the most out of them, adopted the barbarous system of bleeding them of their sap for the purpose of obtaining a few leptas for the resin. His reply, when I remonstrated with him on the subject was characteristic:—"You milk your cows; why should not I milk my trees?" He had evidently forgotten to take the contrast of the final results into his calculation—cows not dying from the operation, whereas trees do.

Madder, which pays so well, and from which large fortunes have been realised in the districts around Smyrna, grows admirably in Greece, and a thousand acres of it could be grown on this estate. It requires a deep, dry soil. It is true that this is a crop demanding capital, as the roots are not fit to dig up for four or five years, but as the return then is both certain and very considerable (the seed alone pays the annual expenses), money would be forthcoming, as it generally is for whatever brings a sure profit. Other plants that yield valuable dyes grow well.

The mineral productions of the property are well worthy of attention. Coal crops out on the surface, but it is lignite, certainly far less valuable than our Newcastle or Welsh coal. As, however, they have proved for many years in Prussia that it is suited for burning on railways, and for all purposes where fuel is wanted, it must not be looked upon too lightly. The dredging machine employed for nearly two years at Chalcis was worked by an engine fed by this coal, from the government pits at Kumi.

Limestone is in abundance, and building stone of various kinds. There are clays and soapstone of the finest quality for making china, with abundance of the best brick earth, and decided traces of iron, copper, and lead in the clay, slate, mica, and quartz rocks.

The game consists of deer (at times only), wild boars, partridges, hares, quail, and woodcocks, but in no great abundance, for every man on the estate is armed, and the country is full, moreover, of eagles, hawks, magpies, grey crows, &c. Hence it is only wonderful that there remains any game at all. There is good fishing on the coast. Sardines are caught by thousands near Chalcis, and fine sponge is also found off the estate.

There are three villages on the property, and the peasants work patches of the land here and there, as let them by the year, giving a portion of the produce in lieu of rent. The taxes are paid the same way. Their dwellings generally consist of one large room, with the cattle at one end; but for seven or eight months in the year they sleep in the open air.

They live in the simplest manner—coarse bread, often from barley or Indian corn, a little cheese or fruit, being nearly their sole diet, while the men drink a little home-made wine, the women never; meat they rarely touch, often taking no more than one meal a day. In many parts they live almost entirely on chestnuts, and in Maïna on bread made from lupins, and dried or salted quail.

These tenants still use the plough as described in the old Greek authors, although they do not quite carry out Hesiod's instructions, that a ploughman should go naked. They have no implements but this plough, and thrash out their crops with horses' feet, by driving them round and round in a circle.

Neither there nor in other parts of Greece have they any idea that lime is suited for manure, that guano exists, that bones are of any use, that the manure made by the cattle is worth carrying to the land, or that change of seed is important. Thus, ignorant of the A B C of cultivation, their sole expedient consists in exhausting one piece of land after another. They can feel no ambition to improve their farms, from their insecurity of tenure, for although compelled to build their own houses, they are liable to be turned out without any compensation. I am happy to say, however, that things are not quite so bad as this in all parts of Greece. There are a few excellent owners of property, who do give their tenants some security and encouragement; but even these know but little of the management of their land or tenants, their best intentions being thus rendered almost nugatory.

No doubt all this is ignorant and retrograde in the extreme, but before Englishmen indulge, as I have often heard them, in wholesale abuse of the Greek peasant for wasting the manure from his cattle, they would do well to look at home.

It is amusing to hear a Kentish antiquarian wandering through Greece ridiculing the people for ploughing with a plough attached to two little cows which provide his family with milk, quite forgetting that his own tenants are perhaps at the very moment working the wet clay soil of his own estate with an old-fashioned Kentish plough, drawn by four great fat horses, nearly a ton weight each, with a man to hold the plough, and a great boy to drive the team, treading the clay land after heavy rain, every footstep of which is injuring the soil perhaps for two years to come.

With respect to the estate, its returns at present are not quite one thousand a-year, whereas, after three years, with sufficient capital and proper management it could not fail to return, after paying interest on the capital employed at 6 per per cent. and all expenses, at the very lowest calculation ten shillings per acre, taking one with another, which would give an increase of £12,500 a-year, after which, under favourable conditions, it must go on augmenting, if the minerals are worked, to an almost unlimited extent. But as the owner will neither let nor sell it on reasonable terms, feeling confident, as he

does, that when the laws relating to land and the working of minerals are changed it will be worth double, I see no prospect of extensive improvement taking place on this or any other estates till then.

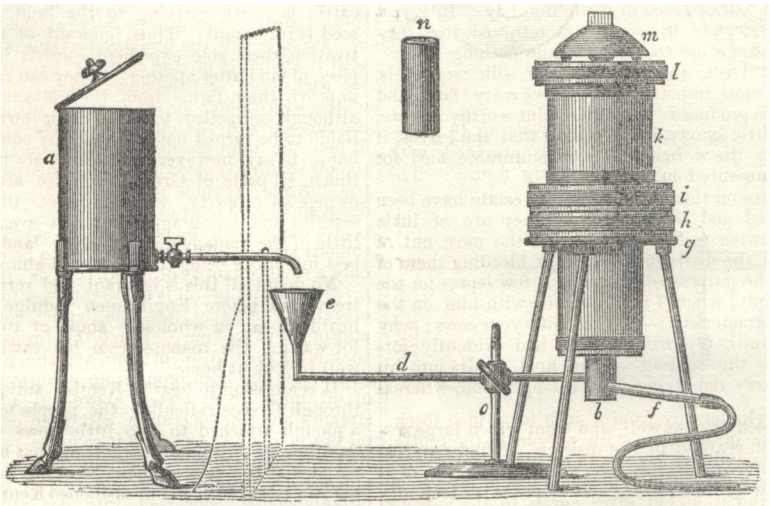
Nor is this by any means an exceptional case; for although Oropo is perhaps one of the finest properties in the kingdom, from its beautiful situation, its proximity to Athens, and its antiquarian interest, for it is hardly possible to turn up a stone at any depth in some parts without lighting on remains of ancient art, there exist many lands of equal value. Within a few miles there is an estate which ordinary tourists would glance at with scorn, as being poor and valueless; but its cottages are roofed with the fine lithographic stones which are supposed only to be found in Germany, and in many places are sold by the pound. Towards Thebes there is another wild district, under the surface of which a vast quantity of Meerschaum clay is found, which, when first extracted, is like a light yellow wax. Passing through Vienna I ascertained that this is worth from £9 to £11 per box, three feet by two and eighteen inches high. I have found, on a soil which would not grow cotton or corn, rocks of pure magnesia, which would yield a far greater return—a mineral unknown in that form, I believe, even in the Geological Museum of Jermyn-street; the magnesia of commerce being now extracted from the magnesian limestone, which is quite a different rock, and only contains about 13 per cent.

It would be well, therefore, for all those interested in the fate of Greece to give due weight to the facts and considerations above enumerated, for they apply to a great part of the country. Hence, too, the Government, possessing over two-thirds of the land, is even more deeply interested in these matters than any private individuals. If we only look at the increase in the taxation of this one estate, taken at a tenth on the gross produce, which the land could well afford to pay if judiciously and fairly levied upon a perfectly different system to the present; if, in addition, we consider what the Government lands now lying waste, or mismanaged, the minerals, quarries, salt works, fisheries, &c., might bring in, we may easily conceive what would be the augmentation of the revenue. Nor would the improvement stop here. It would tell alike on every branch of the moral, no less than of the material, advancement of the people and the country. The export and import duties must necessarily increase to a great extent, and political fermentation would be quieted, for turbulence and discontent are seldom rife amidst a thriving agricultural population.

OIL-LAMP FURNACE.

The object of the inventor, Mr. Charles Griffin, in producing this invention is to enable chemists and metallurgists, who have occasion to melt metals at a white heat, but who happen to have no command of coal-gas, to accomplish their purpose by other agents. This oil-lamp is stated to be not only as powerful in action as the best gas furnaces, but almost to rival them in handiness and economy.

FIG. 1.



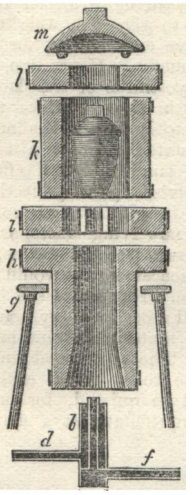
The Oil-Lamp Furnace is represented in perspective by Fig. 1, and in section by Fig. 2. It consists of a wick-holder, an oil-reservoir, and a fire-clay furnace. To these must be added a blowing-machine for the supply of atmospheric air.

The oil-reservoir is represented at letter *a*. It is made of japanned tinplate, mounted on iron legs, and fitted with a brass stopcock and delivery-tube. Its capacity is a little more than a quart. The wick-holder is represented at letter *b*, and the upper surface of it by the separate figure *c*. The wick-holder and the oil-reservoir are consequently detached. *d* is a tube which brings oil from the funnel *e*, and *f* is a tube to be placed in connexion with the blowing apparatus. The wick-holder contains three concentric wicks, placed round the multiple blowpipe *c*, which is in communication with the blowing-tube *f*.

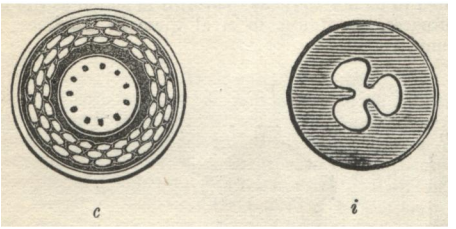
The crucible furnace consists of the following parts:—*g* is an iron tripod; *h* is a flue for collecting and directing the flame. This flue is of such a width, that when the wick-holder *b* is pushed up into it until the top of the wick is level with the top of the clay cone, there remains a clear air-space of about ⅛ inch all round between the wick-holder and the cylindrical walls of the flue.—*i* represents a fire-clay grate, having three tongues, shown by *i*, the separate figure of its upper surface. These tongues support the crucible, without stopping the rising flame.—*k* is a fire-clay cylinder, which rests upon the grate *i*, and encloses the crucible, forming, in fact, the body of the

furnace. Of this piece there are three sizes: the smallest is of 3 inches bore, and works with crucibles that do not

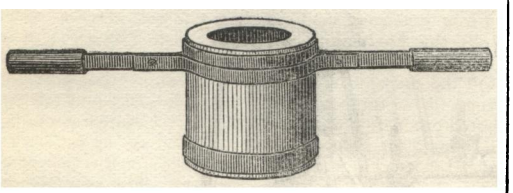
FIG. 2.



exceed 2¾ inches diameter; a middle size, 4 inches bore, for crucibles not exceeding 3½ inches diameter; the largest



size, 5 inches bore, for crucibles not exceeding 4¾ inches diameter. This piece being heavy, is provided with handles, as represented in the following figure. The



walls of these cylinders are from 1 inch to 1½ inch thick. —*l* is a flat plate of fire-clay, with a hole in the centre, used to cover the cylinder *k*, so as to act like a reverberatory dome; *m* is a cover which prevents loss of heat from the crucible by radiation, but gives egress to the gaseous products of the combustion of the oil; *n* is an extinguisher to put over the wick-holder when an operation is ended; and *o* is a support for the wick-holder. No chimney is required.

When in use the apparatus is to be arranged as it is represented by Fig. 1. The cylinder *k* is to be selected to fit the crucibles, and that to suit the quantity of metal that is to be melted. 1 lb. of iron requires the smallest of the three cylinders described above; 1½lb. the middle size; 5lbs. the largest size. The air-way between the crucible and the inner walls of the cylinder should never exceed one-quarter of an inch, nor be less than one-eighth of an inch.

The cotton wicks must be clean, and be trimmed a little below the level of the blow-pipe *c*. If properly managed, they do not readily burn away, but can be used for several fusions. The reservoir should be filled with oil for each operation. The proper sort of oil for use is the more volatile kind of mineral oil, of the specific gravity of ·750, which is now easily procurable at about three shillings per gallon. The variety known by the commercial name of turpenzine answers well. The combustion of a quart of this oil, costing ninepence, gives heat sufficient to melt 5lbs. of cast-iron. Probably the lighter kinds of paraffin oil may be suitable. Liquids of the alcohol class, spirits of wine, and pyroxylic spirit can be used, but they are less effective and more expensive than turpenzine. Care must be taken not to spill the oil on the table or floor, and not to decant it carelessly in the neighbourhood of a light, because atmospheric air strongly charged with the vapour of these light oils is explosive. When the oil is burnt in the furnace, in the manner described below, there is no danger. During an operation, a wooden screen, as represented by the dotted lines in Fig. 1, should be placed between the oil-reservoir and the furnace, to prevent the vaporisation of the oil by radiant heat.

As the wick-holder *b* and supply-pipe *d* contain only about one fluid ounce of oil, the oil must be run continuously, during a fusion, from the reservoir *a* into the funnel *e*, in order that the cotton may be always flooded. The success of the fusion depends upon the due supply of oil, to which point the operator must pay attention. At the commencement of a fusion, the oil must be run from the reservoir until the surface of the oil in the funnel has a diameter of about an inch. The wicks will then be flooded, and a light may be applied, and a gentle blast of air set on. The oil immediately sinks in the funnel; and the stopcock must be opened, and so regulated as to keep the oil barely visible at the bottom of the funnel. If too much oil is supplied, it immediately rises in the funnel, and simultaneously overflows the wick-holder. Too much vapour is then thrown into the furnace, and the heat is immediately lowered, especially at the beginning of an operation, before the fire-clay portions of the furnace are well heated. If, on the contrary, too little oil is supplied, the wicks burn, and the operation is spoilt. The demand of the wick-holder for oil depends upon the condition of the furnace and the character of the fusion in progress. When the lamp is newly lighted and the furnace cold, the oil should be passed slowly, in distinct drops; but, as the furnace becomes hot, the rapidity of the supply of drops should be increased; and, finally, when the furnace is at a white heat, the oil should be supplied in a thin continuous stream. When the fusion to be effected is that of only a small quantity of metal, such as 1lb. of iron, a rapid supply of drops of oil is sufficient even to the close of the operation. At that rate the burner consumes about 1¼ pint of oil in an hour. When the fusion to be effected is that of 4lbs. or 5lbs. of iron, and the large furnace is in action, and has been brought to a white heat, the supply of oil must be as stated above—in a thin continuous stream—and the operation will then consume 2 pints of oil in the hour. And here it requires remark that, with that continuous supply, when the furnace is large and is at a white heat, the oil does not rise in the funnel, being instantaneously converted into gas at the mouth of the burner, and thrown up in that state into the furnace for combustion. The operation, indeed, consists, at that point, of a rapid distillation of oil-gas, which is immediately burnt, in the presence of air supplied at a suitable pressure by a dozen blowpipes, in effective contact with the crucible to be heated.

The flame produced in this furnace is stated to be as clear as that produced by an explosive mixture of air and coal-gas. It is perfectly free from smoke, and the unconsumed vapours which occasionally escape with the gaseous products of the combustion, are even less unpleasant to smell and to breathe in than are those which are usually disengaged by a blast gas furnace, or by an ordinary lamp fed with pyroxylic spirit. The contents of a crucible under ignition in this furnace

can at any moment be readily examined, it being only necessary to remove the pieces *l* and *m* with tongs, and to lift the cover of the crucible, during which the action of the furnace is not to be interrupted. When the operation is finished, the blast is stopped, the stop-cock is turned off, the oil-reservoir is removed, the wick-holder is lowered on the support *o*, withdrawn from the furnace, and covered with the extinguisher *n*. The quantity of oil which then remains in the lamp is about one fluid ounce.

The furnace being cold when an operation is commenced, it will melt 1 lb. of cast iron in 25 minutes, 1½ lb. in 30 minutes, 4 lb. in 45 minutes, and 5 lb. in 60 minutes. These results have been obtained by experiment. When the furnace is hot, such fusions can be effected in much less time; for example, 1 lb. of iron in 15 minutes. It need scarcely be added, that small quantities of gold, silver, copper, brass, German silver, &c., can be melted with great ease, and that all the chemical processes that are commonly effected in platinum and porcelain crucibles can be promptly accomplished in the smallest cylinder of this furnace; and, in the case of platinum vessels, with this special advantage, that the oil-gas is free from those sulphurous compounds, the presence of which in coal-gas frequently causes damage to the crucibles.

The size of the blowing-machine required to develop the fusing power of this Oil-Lamp Furnace depends upon the amount of heat required, or the weight of metal to be fused. For ordinary chemical operations with platinum and porcelain crucibles, and even for the fusion of 1 lb. of cast iron in clay or plumbago crucibles, a blowing power equal to that of a glass-blower's table is sufficient, provided the blast it gives is uniform and constant. But the fusion of masses of iron weighing 4 or 5 lbs. demands a more powerful blower, such as is commonly used in chemical laboratories, for the supply of air to blast furnaces when fed by gas or coke. The highest power of the Oil-Lamp Furnace depends, indeed, upon the power of the blowing-machine that is to be used with it. Much more than 5 lbs. of iron can be melted by the gas which this oil-lamp is capable of supplying, provided a sufficiently powerful blowing-machine supplies the requisite quantity of air. When more than a quart of oil is to be rapidly distilled into gas, and the whole of that gas is to be instantly burnt with oxygen, it is evident that effective work demands a large and prompt supply of air.

Manufactures.

LOCOMOTIVES.—The number of locomotives on the railways of the United Kingdom at the close of 1860 was 5,801; at the close of 1861 it was 6,156; and at the close of 1862, 6,398. Thus, an additional locomotive was brought into use almost every day, if Sundays be excepted. Even allowing twenty years as the natural life of a locomotive, upwards of 300 new engines would be required to keep up the stock every year at its present level; and irrespective of any foreign demand it may be affirmed that at least 500 locomotives will be required annually on home account for an almost indefinite period. Allowing £2,500 as the cost of each engine, the 500 new locomotives annually called for represent an aggregate of no less than £1,250,000. Between 12,000 and 13,000 drivers and stokers must be now regularly employed, and these men represent a population of at least 60,000 persons.

CUTTING OUT CLOTHES BY MACHINERY.—At the Government tailoring establishment at Millbank, where the army clothing is made, and about sixty sewing machines driven by steam are in operation, the material is cut out by machinery. A sharp thin endless riband of steel revolves like a band saw over pullies driven by steam, and the cloth in layers six to eight inches thick, with the pattern chalked on the upper layer is applied to the revolving knife, which rapidly and smoothly cuts it to the required shape, the hand of the workman being simply employed to guide the cloth so that the knife follows the chalked pattern.

SAFE KEEPING OF PETROLEUM.—On the 29th of July, 1862, an act was passed by which licenses for the keeping petroleum were required by the Metropolitan Board of Works. It appears that thirteen applications for licenses have been made, of which two only were granted, eleven being refused.

GENOA has now four foundries and mechanical establishments. The first, which is regarded as the most important metallurgical establishment of Italy, is managed by Messrs. Orlando Brothers, and has been in activity since 1848, when it was formed with a concession from the Government. The works employ 700 persons, and consume annually nearly 1,800 tons of pig iron and combustible. Most of the good workmen and foremen of Upper Italy receive their mechanical training there, the works producing every description of manufacture, such as rails, pipes, steam-boilers, &c. Fifty locomotives for the railways of the old Sardinian and Tuscan States were supplied from this establishment, and it is expected that the number of men employed will soon be increased from 700 to 1,000, as Messrs. Orlando, intending to undertake the construction of ships of war for the State, have just made very extensive arrangements with that object. The foundry of Messrs. Balleydier, which occupies 350 men, has an annual consumption of 1,000 tons of pig iron and combustible. The works of Mr. Robertson, again, employ 300 men, and consume annually 900 tons of materials. The fourth establishment was only brought into operation in 1860, by Signor Migone, a Genoese. At present it employs only 30 workmen, and its annual consumption of materials is limited to 30 tons. The hydraulic wheels and hydrodynamic machines of Mr. Robertson are highly esteemed in Italy; and Messrs. Balleydier Brothers also enjoy a high reputation for objects of domestic use and important works of art. Thus they have, during the last few years, erected bridges over the Bisagno at Genoa, over the Serivia at Seravalle, and over the Secca at the Val Polieveira.

THE SCOTCH IRON TRADE.—The development of the iron resources of Scotland makes steady progress. The variety of uses to which iron is being applied is stimulating production, and giving this country a leading position among the iron-making nations of Europe. In 1829, the year after the introduction of the hot-blast process, the total yield of Scotland was 29,000 tons. Fresh discoveries of iron ores being made, new works were erected, and in 1851 the production had increased to 760,000 tons per annum; the price that year averaging 40s. 1d. per ton, and the stock at the end of the same amounting to 350,000 tons. Now there are 134 furnaces in blast, and the computed production for the year just terminated amounts to 1,160,000 tons, thus showing an increase of 80,000 tons over 1862. The value of the make for the year at the present price represents £3,800,000. The average number of furnaces in blast was 127, employing about 45,000 men, and producing an average of 22,320 tons of pig iron weekly. The price is now 10s. per ton higher than the average price of the last eighteen years, and the highest reached since the revulsion of trade in 1857. Fluctuating between 55s. at the opening of 1863, and 51s. in May last, the price has recovered and ascended, with occasional reactions of a few shillings, to 68s. 6d., making the average price for the year 55s. 9d. a ton. The high price sustained during the past month in the face of dear money and declining exports, illustrates in a striking manner the sanguine views of capitalists who have been operating in this and other leading staples of produce. The shipbuilding yards on the Clyde, the foundries, and malleable iron works are generally actively employed, and the price of bar and angle iron has advanced fully 50s. per ton.

COTTON MANUFACTURES.—Spinners and manufacturers complain that the margin between the prices of the raw material and those of yarns and goods, entail a serious

loss on them; hence the desire to reduce production, in case matters do not speedily change for the better. The exports of cotton fabrics of the eleven months of 1863 compared with the preceding year, show still a slight decrease in quantity, but the declared value exceeds that of 1862 by £8,000,000 for cotton yarns and manufactured goods. The export trade is doubly important now, for inasmuch as it is proportionate to our imports it will mitigate the drain of bullion. The quantity of cotton taken for consumption in 1863 was 1,299,140 bales, against 1,041,860 bales in 1862; the actual export of cotton 467,120 bales against 416,440. The quantity taken for speculation last year was 1,275,510 bales against 1,660,100 in 1862.

TEXTILE MANUFACTURES.—In the manufacturing districts there has been great activity connected with the linen, woollen, and jute branches, the tendency being to displace, to a considerable extent, the consumption of cotton. The enhanced value of linen and jute fabrics may be estimated at thirty per cent. last year as compared with 1862. In the West of Scotland, from the improved prospect of the supply and the demand, as well as from the loss entailed in remaining idle, it is estimated that about three-fourths of the cotton-mill power is at work.

Commerce.

SUGAR.—There are twenty sugar refineries on the Clyde, of which eighteen are at work and two on the point of commencing.

DRIED BEEF FROM THE RIVER PLATE.—Imports of the South American dried beef from Uruguay, to which a medal was awarded at the last International Exhibition, continue to be made at Liverpool, where it is sold from the ship at the rate of £18 13s. 4d. per ton, or 18s. 8d. per cwt.

THE LATE GALES.—At no recent period have the disastrous effects of storms been more severely experienced than during the hurricane of the 2nd and 3rd December last. Its results were felt, more or less, in all parts of the country. About 11 a.m. on the 3rd, the anemometer at the Royal Exchange, London, registered a pressure of 30 lbs. to the square foot. During the gales of October last, a similar instrument at Greenwich registered 29½ lbs., whilst the one at the Royal Exchange only showed a pressure of 18 lbs. It is supposed that upwards of two hundred and fifty vessels were wrecked during those two disastrous days, and that the loss of life was proportionately great. It is, however, very gratifying to find that, owing to the gallant and persevering exertions of the crews of the lifeboats, two hundred and forty-six persons were happily saved from the numerous shipwrecks on various parts of our coast. During the year which has just closed 378 lives have been saved by the boats of the National Life-boat Institution, whilst in the same period 301 lives have been rescued by shore-boats, to the crews of which the Society has granted rewards, thus making a total of 679 persons saved from shipwreck during the year, through the instrumentality of this valuable institution. Since the beginning of the year (1863), the institution has also expended about £13,000, on its various life-boat establishments, on the coasts of England, Scotland, and Ireland. The number of lives saved, either by the life-boats of the Society or by special exertions, for which it has granted rewards since its formation, is 13,530, and since the establishment of the Institution it has granted 82 gold medals, 733 silver medals, and £17,730 in cash, for saving life from shipwreck, in addition to £80,000 expended by the Society on its life-boat establishments.

SHIPBUILDING ON THE CLYDE.—The Scottish engineers and shipbuilders were remarkably active last year, the shipbuilding trade having taken a start as decided, compared with the years immediately preceding, as it took in 1854, which was the culminating point of a former period of progress. The vessels built during the past year, and now in the course of being built, represent 266,643 tonnage, or 100,000 tons above 1862, which was much on a par with 1854. Of this amount of tonnage only four per cent. is wood, two per cent. of wood and iron combined, and the balance entirely of iron. The returns are as follow of vessels built or in course of construction:—

	No.	Tonnage.	Horse Power.
Sailing vessels, iron	87	69,657	
,, wood and iron	4	3,638	
,, wood	19	10,280	
Screw vessels, iron	143	130,610	23,815
,, wood and iron	1	1,821	500
Paddle vessels, iron	76	50,637	16,573
	330	266,643	40,888

The shipping interest has not been so prosperous since 1852 and 1853, during the great tide of emigration.

SWEDEN.—Government is endeavouring to obtain such revisions of the Swedish tariff as will promote the interests of British trade. As a preliminary step the Government has applied to certain Chambers of Commerce for information relative to the operation of the high Swedish duties on the trade of this country,

THE FRENCH WINE TRADE.—The exports of *vins ordinaires* to England during the first ten months of 1863 amounted to 82,112 hectolitres, against 81,771 hectolitres in the corresponding period of 1862, and 81,000 hectolitres in the corresponding period of 1861. The exports to Belgium have been 70,608 hectolitres last year, against 117,168 hectolitres in 1862, and 75,787 hectolitres in 1861; to the Hanseatic towns, 81,018 hectolitres last year, against 88,264 hectolitres in 1862, and 77,771 hectolitres in 1861; to Italy, 143,429 hectolitres last year, against 124,789 hectolitres in 1862, and 222,976 hectolitres in 1861; to Switzerland, 205,759 hectolitres last year, against 227,324 hectolitres in 1862, and 207,652 hectolitres in 1861; to the United States, 62,237 hectolitres last year, against 73,413 hectolitres in 1862, and 74,191 hectolitres in 1861; to Brazil, 74,338 hectolitres last year, against 66,375 hectolitres in 1862, and 81,916 hectolitres in 1861; to Algeria, 208,331 hectolitres last year, against 191,614 hectolitres in 1862, and 188,897 hectolitres in 1861; and to other destinations, 456,941 hectolitres last year, against 581,728 hectolitres in 1862, and 456,937 hectolitres in 1861; making a total of 1,384,773 hectolitres last year, against 1,552,446 hectolitres in 1862, and 1,466,627 hectolitres in 1861. The exports of *vins de liqueur* in the first ten months of last year were 23,842 hectolitres, against 71,335 hectolitres in the corresponding period of 1862, and 69,656 hectolitres in the corresponding period of 1861. On the whole the shipments of French wines show rather a marked falling off last year.

THE WOOL TRADE in general has been in a very satisfactory state during the year just ended, manufacturers with hardly any exception having been well employed throughout. The imports were again in excess of the previous year, the increase showing most in Australian and East India wools. The exports were also considerably larger than in 1862, France having taken eleven million pounds more of colonial than in the previous year, and America two million pounds more of foreign. The exports of woollen manufactures amount to considerably more to all parts of the world than they have ever done before, reaching in the aggregate for the eleven months ending with November, to no less than £27,400,000 against £15,257,000 for the same period in 1862.

CONSUMPTION OF PAPER.—From the last trade returns it appears that the consumption of foreign paper in England is considerably on the increase, 112,503 cwts. having been imported in the first eleven months of last year, against 92,288 cwts. in the corresponding period in 1862. Belgium supplies the largest quantity—no less than 61,950 cwts. out of the 112,503 cwts. having come from that country. In the eleven months ending November, 34,746 tons of rags used in the manufacture of paper reached the English market from abroad.

FRAUDULENT TRADE MARKS.—On Friday last, January 1, "The Merchandise Marks Act, 1862," came into operation. It makes it a misdemeanor to forge or counterfeit any trade mark, or falsely to apply any such trade mark, with intent to defraud, whether applied to a cask, bottle, stopper, vessel, case, cover, wrapper, band, reel, ticket, label, or any other thing in or with which any commodity is sold, or intended to be sold. It is henceforth an offence to sell or expose, either for sale or for any purpose of trade or manufacture, articles with forged or false trade marks, under a penalty of a sum equal to the value of such articles, and a sum, besides, not exceeding £5 nor less than 10s. Every addition to and every alteration and imitation of any trade mark made with intent to defraud—the intent being of the essence of the offence in all cases—is to be deemed a forgery, and punishable as such—namely, in addition to the penalties for misdemeanor, by the forfeiture of every instrument used for the purpose of the fraud, and of every article to which such false mark shall be applied. It is made obligatory on every person who shall sell an article having a false trade mark to give information, on a demand in writing being made upon him, as to where he procured it; and power is given to justices of the peace to summon parties refusing or neglecting to afford such information, and, in the event of their persisting in their neglect or refusal, to impose a penalty of £5. To mark any false indication of quantity upon an article with intent to defraud is made punishable by a penalty equal to the value of the article, and the payment of an additional sum not exceeding £5 and not less than 10s. A conviction under the Act is not to affect the civil remedy at law, in equity, or otherwise; nor in any indictment, information, or proceeding under its provisions need an intent to defraud any person in particular be alleged or proved. The punishment on conviction of any offence which by the act is made a misdemeanor is to be, at the discretion of the court, imprisonment for not more than two years, with or without hard labour, or by fine, or both; by imprisonment, with or without hard labour and fine, and also by imprisonment until the fine (if any) shall have been paid and satisfied. The time for taking proceedings under the act is limited to three years next after the commission of the offence, or one year after its first discovery by the person proceeding. The vendor of an article with a trade mark is to be deemed to warrant or contract with the purchaser that the mark is genuine, unless the contrary shall be expressed in some writing signed by or on behalf of the vendor and delivered to and accepted by the purchaser. The seller of an article, too, with a description upon it of its quantity, is to be deemed to contract and warrant that the description is true, unless, as before, the contrary shall be expressed in writing delivered to and accepted by the buyer. In suits at law or in equity against persons for using forged trade marks the court may not only order the article to be destroyed, but may by injunction stop a repetition of the offence.

Colonies.

NEW KINDS OF COTTON.

By P. L. SIMMONDS.

In the Natal Court of the late Exhibition I was much struck with some samples of vegetable fibre, which, in its texture and colour, more resembled wool than cotton. I have since, after some research and investigation, traced out the plant producing it, which is the *Batatas paniculata*, Ch. (*Ipomœa insigni*, Bot. Mag. 1790). It is No. 94 of Kraus's Natal plants, and the following description of it, from Don's "History of the Dichlamydous plants," will serve to identify it:—"*Batatas paniculata*, Chois. Twining, glabrous; leaves palmate, 5-7 cleft; lobes ovate-lanceolate or elliptic, bluntish, rarely sub-acuminated; peduncles much exceeding the petioles, many-flowered, dichotomously and corymbosely panicled; sepals, ovate roundish, concave, very blunt, equal, perennial, herbaceous. Native of the East Indies, banks of the Irawaddi, &c.; New Holland, Java, Guinea; Cayenne, and the banks of the Orinoco in America. Root thick, round, in the Guinea plant elongated, leaves large, 3-4 inches long and as much broad, corolla large, purple, capsule usually four-celled, but sometimes three-celled by abortion, seeds furnished with long hairs at top, which are bent in within the capsule." Flowers in June and September. Introduced in 1799. Of the cultivation of the species in general, Don says:—"The species of Batatas are strong, free-growing plants, of easy culture, only requiring plenty of room to spread. They are well adapted for trellis work, or to run up pillars in stoves. They are all tuberous-rooted plants; and therefore require to be kept dry when in a dormant state. Light rich soil suits them best. Young cuttings strike root readily under a hand-glass in heat. They are all very showy when in blossom."

Now the questions to be determined are, the suitability of the fibre for spinning, its probable value, and whether it could be cultivated with advantage. I would simply draw the attention of persons abroad to the expediency of collecting and sending home a sufficient sample to determine whether it could be easily separated from the seed, spun, and dyed.

The appended extract from a letter which I received by the last mail, from Mr. John Robinson, of Natal, calls attention among other things to another species of cotton growing wild in that part of South Eastern Africa.

"I enclose you a small sample of perfectly wild cotton that has just been brought me from Zululand. It was found at the base of the Bomba mountains—a range of heights 100 miles north of Natal, and about 25 miles from the sea coast—parallel with St. Lucia Bay. In this locality the plant grows indigenously in great abundance. You will be better able to judge of the quality than myself. I also send a seed with it. The gentleman who gave me the specimen has just returned from a hunting trip in those regions. There is a vast field of undeveloped wealth here if one only had time, or knew how to make use of it. A sort of wild vegetable silk abounds also, and as soon as I can get some you shall have a specimen. I have introduced Latakia tobacco here with great success, the seed being personally procured on the spot. It grows even better than in its proper home. The variety had not reached Australia, I was informed by a Victorian colonist, and I have therefore sent a considerable quantity of Natal grown Latakia seed to Melbourne, where it will doubtless thrive. An effort will be made shortly to introduce the Alpaca here. No country ought to suit the animal better than one in which deer of every kind are so abundant. In the Cape colony also an effort to acclimatise them is about to be made. The mineral wealth of Natal has attracted the notice of some British capitalists, and a company has been formed to work the coal and iron mines of the colony. The legislature has promised it a 30 years' exclusive right to mine and export on condition of it—the company—making a railway to the coal fields, about 130 miles from the port. Six miles of crown land along the line has also been promised. The coal is good and abundant, in seams from five to eight feet thick. If the scheme is carried through it would work wonders in this part of South Eastern Africa."

In the last volume of the *Journal* of the Society, p. 655, it is stated that cotton had been found in Cuba growing on a vine which runs along the ground. It is not very fine, but white and strong, and has been tried, it is said, in various parts of Jamaica.

The few facts cited seem to show that there are new cotton-yielding plants yet to be experimentalised on, which promise useful results.

NATAL.—The breed of horses in this colony has improved greatly of late, several valuable entire horses having been imported from England. The demand for horses in Natal is, however, small, and unless some outlet for this description of stock can be found, the market will soon be glutted. An excellent description of horse, fitted for Indian cavalry, could be found here, from three years of age upwards, for about £20 each. The horses in Natal are stronger and more developed, harder, with better feet and legs, than those in the Cape colony. They are very docile, and stand the heat better than any horses out of Asia. Mr. Duffield, a gentleman largely interested in the importation of alpacas in Australia, states that from his experience in these animals, and his knowledge of the climate of Natal, he has not the slightest doubt that they would thrive well there. The luxuriant pastures of Natal, now virtually waste for want of stock, seem to be admirably adapted to the habits of these animals.

PRINCE EDWARD ISLAND.—The population of the island, by the census returns taken in 1861, was 80,857, an increase of 13 per cent. in six years. The number of acres of land under cultivation has increased since 1855 from 322,298 to 368,127 acres. There still remain nearly one million acres in a wilderness state, of which but little is incapable of cultivation. Oats and potatoes are the largest crops raised. Fishing occupies a large share of attention, as there are 1,300 boats engaged in the shore fisheries. There are many manufactories in the island, including 55 tanneries, 176 saw-mills, and 46 carding-mills.

NEW SOUTH WALES.—The abstraction of her pastoral districts by the establishment of new colonies from her former territory is greatly reducing the number of sheep in New South Wales, although the horned cattle and live stock progress. In 1850 New South Wales owned over thirteen million head of sheep, but the establishment of Victoria as a separate colony in 1851 reduced the number of sheep in the boundaries of the old colony below seven-and-a-half million; these increased in five years by about one million, but the separation of Queensland in the close of 1859 again brought down the number to five millions, and now the old colony scarcely owns more than five-and-a-half millions, whilst the younger offspring, Queensland, with its extensive pasturage, has more than four million sheep.

GAMBIA.—The average exports of ground nuts, the staple article from this colony, were, in the ten years, 1850 to 1860, 11,196½ tons; in 1861 they had increased to 12,632½ tons, of the value of £101,060. A large quantity of these go to Marseilles to be crushed for oil, used in soap-making. Hides, wax, and ivory are the other exports, amounting in value to about £24,000.

IN TASMANIA endeavours are being made in favour of a Grand Trunk Railway from Hobart Town to Launceston. The capital required is estimated at about 1½ million sterling.

NEW SOUTH WALES.—SILKWORMS.—At a recent meeting of the Acclimatisation Society, Dr. Bennett read a letter from Mr. Baker, of Young, dated September 20th, respecting the introduction of the silkworm which feeds upon the foliage of the castor oil tree, the Arrindy silkworm. The writer of the letter expresses a desire of having some of the worms for the purpose of rearing them, in the district in which he resides. Dr. Bennett mentioned that, as many letters had lately been received by the society from various parts of the colony on the same subject, it might be advisable to state that every exertion was being made by this society, as well as also by that of Melbourne, for the introduction of this valuable silkworm from Calcutta. All those that had been as yet sent from India had perished during the voyage; but as better arrangements were being made for insuring their surviving the transit, the society hoped before long to gratify the wishes of the members by being able to announce the safe arrival of these silkworms for distribution.

JAMAICA.—The number of immigrants in the island on the 30th September last was 6,096; namely, 152 Portuguese, 226 Chinese, 3,955 East Indians, and 1,763 liberated Africans. The necessity for providing an island institution in which the youth of the colony may undergo a systematic training and acquire professional education is engaging the attention of the Legislature. It was referred to in the Legislative Council by the Hon. Dr. Hamilton, in a speech on the medical and sanitary wants of the country, and it will shortly be brought prominently to the notice of the Assembly, Dr. Bowerbank having notified that he will, on an early day, enquire of the members of the Executive Committee whether the Government have in contemplation the introduction of any measure for the consolidation and amalgamation of the different educational charities or behests of the island for the purpose of establishing a public or island college.

IN ST. VINCENT a famine prevails, in consequence of the total absence of rain for the last 15 months.

GOLD IN NEW ZEALAND.—The total value of the gold raised in the province of Otago, in New Zealand, during two years, has been £4,024,080. The province of Otago proves to be one vast gold field. Rich diggings are constantly being discovered there.

AUSTRALIAN GOLD.—The supply of gold brought down under escort to Melbourne, from the 1st January to the 23rd October, 1863, was nearly on a par with that of the previous year, being 1,160,013 ounces. The total produce of the Victorian mines, in 1862, was 1,393,874 ounces; the average of the three years immediately preceding being 2,014,581 ounces. The following have been the imports of gold into the United Kingdom, from Australia, in the last six years:—

1858 ...	£9,725,108	1861 ...	£6,474,451
1859 ...	9,830,944	1862 ...	6,310,500
1860 ...	6,659,590	1863 ...	5,164,752

ARROWROOT.—The production of arrowroot is declining in Bermuda, Natal, and other colonies. In Bermuda, the value of the arrowroot imported declined from £10,334 in 1851, to £4,291 in 1861. The cultivation of arrowroot, being attended with some trouble and requiring skilled labour, has given way to that of the potato and the onion, which give crops as precarious as the arrowroot, and require a greater breadth of land, but as they can be grown by any one who can handle a spade they are largely undertaken by the poorer classes. In Natal, the culture of arrowroot which was formerly the most remunerative product of the coast districts, has now been almost entirely superseded by that of sugar.

Obituary.

REAR-ADMIRAL WASHINGTON, Hydrographer of the Admiralty, died at Havre, on the 16th September, 1863, after a painful illness of several months' duration, brought on by excessive mental labour. About the beginning of last summer his medical advisers strongly recommended a complete cessation of his duties, and he accordingly went to Normandy, where he frequently spent his vacation. This, however, afforded him no relief. His bodily frame continued to give way under the pressure of a complaint which, with but slight external symptoms, had been from the beginning of the present year undermining his constitution. He was in his sixty-fourth year when he died, having been born on the first of January, 1800. He entered the Navy on May 15th, 1812, as a first-class volunteer on board the *Junon*, 46 guns, Captain James Saunders, fitting for the North American station, where he took part in many operations in the River Chesapeake. Removing as midshipman in the following October to the *Sybille*, he sailed

in that ship in 1814, under Captain Forrest, with the *Princess Caroline*, Captain Downman, for the latitude of Greenland, in fruitless pursuit of the American Commodore Rogers. In November of the same year, having returned to England, he entered the Royal Naval College at Portsmouth. On leaving the Royal Naval College, he was received, in May, 1816, on board the *Forth*, Captain Sir Thomas Louis, under whom he was again employed for upwards of three years on the Coast of North America. He then in succession joined the *Vengeur* and the *Superbe*, both on the South American station, where he remained until after his promotion to the rank of Lieutenant, which took place on the 1st January, 1821. He was subsequently employed on particular service, and in August, 1830, was appointed to the *Royal George*, 120, as flag-lieutenant to Admiral Sir John Poer Beresford, Bart., Commander-in-Chief at the Nore—continuing to serve under that officer in the *Ocean*, until advanced to the rank of Commander in 1833. To the active service, consequent upon his various appointments, he had united the practice of maritime surveying, and the combined pursuits of a Scientific Hydrographer and Geographer. In 1835 he succeeded Captain Maconochie as Secretary of the Royal Geographical Society of London, but resigned that office in 1841, on being appointed to continue the survey of the North Sea, which had for some time been in progress, in which he was continually engaged until the close of 1844. In 1842 he was promoted to the rank of Post-Captain, in compliment to the King of Prussia. In 1845, he was appointed a Member of a Royal Commission for inquiring into the state of the rivers, shores, and harbours of the United Kingdom. He was subsequently engaged in an inquiry into the condition of the fisheries on the North-east Coast of Scotland. His able report, and the clear plans of the different classes of fishing-boats which accompanied it, prepared expressly by Mr. James Peake, Master-Shipwright of H.M.'s Dockyard, Devonport, deservedly attracted considerable attention. In 1858 Captain Washington became a Member of the Royal Commission to inquire into the sites for Harbours of Refuge along the coasts of the United Kingdom. In the year 1862 Captain Washington was promoted to the rank of Rear-Admiral. In 1849 an awful accident with a life-boat occurring at the mouth of the Tyne, induced him to put forth his best energies to prevent the recurrence of similar disasters, and he gave his valuable services to aid the Duke of Northumberland, who, with a view of procuring a better description of life-boat, offered a prize of £100 for public competition. The result of the labours of the Northumberland Committee was embodied in an elaborate and valuable report prepared by the late Admiral. Together with this report was published the first Wreck Chart of the British Isles. Its unique appearance excited great attention, and to Admiral Washington is unquestionably due the credit of the compilation and publication, under the authority of Government, of the Annual Wreck Register and Chart of the United Kingdom. In 1853, Captain Washington visited some of the Russian fortresses in the Baltic. In the following year the war broke out, and the results of his acute observations during that tour proved of the greatest value. In the year 1855 he was appointed by Sir James Graham to the responsible office of Hydrographer of the Admiralty, on the retirement and special recommendation of the late Admiral Sir Francis Beaufort, F.R.S. One of the last public labours of the late Admiral was to act as a Juror at the International Exhibition of 1862. He was unanimously elected Chairman of the section which embraced those objects he had so long studied. In 1833, Admiral Washington married Eleonora, youngest daughter of the Rev. H. Askew, Rector of Graystock, in Cumberland, by whom he had three sons and one daughter. His funeral took place at the Protestant cemetery of St. Marie, Havre, on the 19th September, with every demonstration of respect on the part of the foreign authorities of the town. The heads of departments at Havre,—civil, naval, and military—attended the funeral. Officers and men of the imperial yacht *Prince Jerome*, to the number of forty, formed part of the *cortège*. The English ships in the harbour hoisted their colours half-mast high, the captains of two large steamers volunteered their attendance, and six of their seamen were gratefully accepted by the family as bearers. The Lords Commissioners of the Admiralty afterwards expressed officially to the authorities of Havre, their deep sense of the honours so gracefully bestowed. In 1852, he delivered a lecture before the Society of Arts, on the "Progress of Naval Architecture as indicating the Necessity of Scientific Education, and the Classification of Ships and of Steam-engines: also, on Life-boats," one of the Series of Lectures on the "Results of the Great Exhibition of 1851," delivered at the suggestion of H.R.H. Prince Albert, the President of the Society. He was a Fellow of the Royal, Astronomical, and Geographical Societies; an Associate of the Institution of Engineers; as also a corresponding Member of several foreign Geographical Societies.

JAMES TULLOCH, F.R.S., was born in London, on the 7th February, 1788. He was sent at an early age to France and Holland, for the purpose of acquiring the modern languages, with a view of becoming a foreign merchant: but after a residence of several years at the University of Leyden, he returned to England, and joined his brother, John Tulloch, in commercial pursuits, which they successfully carried on until the peace in 1815. He then visited various parts of the continent, turning his attention especially to objects connected with industrial progress and advancement. He observed, while on his tour, the extensive use of marble, arising from the low price at which it was obtained as compared with that in this country. This circumstance suggested to him the desirability of applying machinery to the sawing and otherwise working marble, and in 1820, under the advice of the late Bryan Donkin, he patented machinery which he had invented for this purpose. In 1821 he formed a joint stock company, for importing marble and working it by his machinery, which proved itself eminently successful, and so much so, that to this day there has been no material deviation, if any, from the plan he originated. The application of this machinery has been the means of considerably reducing the cost and increasing the consumption of manufactured marble in this country. The late Profesor Cowper, of King's College, gave the following evidence before the Parliamentary Committee on the Arts and Principles of Design, in 1836:—"Question 614. Is there not some tendency now existing towards the conversion of various marbles to purposes of art? Answer. There is, both as to the various marbles and various other materials. At the Marble Works, Esher-street, Horseferry-road, there is a beautiful system of machinery for working ornamental marble: mouldings, slabs, and pilasters, of beautiful workmanship, are executed in British and foreign marbles at a low price. The whole is the contrivance of Mr. Tulloch, an independent gentleman of great taste, as his large collection of paintings by the old masters testifies. He, from observing the great use of marble in Italy and other countries, contrived this machinery for the express purpose of introducing marble into more general use in this country." In 1821, in conjunction with his brother, he originated the Guardian Fire and Life Insurance Office, which is now one of the leading insurance offices. On his retirement from the office of managing director, in 1856, the directors presented him and his brother also, each with a handsome vase, in testimony of the high sense entertained of the ability, zeal, and important services rendered by them. After resigning his office he employed his leisure in following his favourite amusement, the study of the works of ancient and modern masters, of which he had several fine specimens in his gallery. Mr. Tulloch died 22nd March, 1863, aged 75 years. He was elected a member of the Society of Arts in 1842.

Publications Issued.

A HANDBOOK OF PRACTICAL TELEGRAPHY. By R. S. Culley, Telegraphic Engineer, London. (*Longman, Green, and Longman.*) This work is addressed to those who really require it, the practical men engaged in telegraphy, and it is published under the sanction of the chairman and directors of the Electric and International Telegraph Company. The work is divided into ten parts, and treats of the laws which regulate the application of electricity to telegraphic purposes; the methods adopted to detect faults and defects, and where they are situated; the management of apparatus, and the general construction of lines.

A MAP OF THE METROPOLITAN RAILWAYS. Sheet, 2s. 6d., mounted in case, 4s. 6d. (*Edward Stanford.*) This shows the lines in operation and sanctioned; also the proposed railways, plans of which were deposited on or before the 30th November, 1863.

Notes.

SUBMARINE CABLE FOR THE ITALIAN GOVERNMENT.—A submarine cable for this government is now in the course of manufacture at the works of Mr. J. W. Henley, North Woolwich. It is to be submerged between Ottrante and Avalona, and is to be sixty-two miles in length.

TELEGRAPHY.—There are now not less than 10,000 telegraphic stations in Europe for the receipt and despatch of messages; in India, 160; in Australia, viz., Queensland, 6; New South Wales, 35; Victoria, 44; South Australia, 21.

THE METROPOLITAN BOARD OF WORKS.—The receipts of the Board during the year 1863 were £1,125,116; payments during the same period £1,115,610.

LAYING ON HEAT.—An American paper states that a scheme is under consideration for warming houses from a central source, and supplying the inhabitants of a town with heat as gas now is supplied. Professor Cotta, of Freiberg (Saxony), some years since, proposed plans for this purpose.

ANCIENT EXHIBITIONS.—In a work lately published on Egyptian Chronology, by Hekekyan Bey, a learned Egyptian civil engineer, speaking of Cœechos, one of the first dynasty of seventeen Thinite kings, and who, he states, reigned for 39 years over Egypt, from 5350 to 3511 years before Christ, he says, "Under him the Egyptians instituted universal exhibitions of cattle, in which the state awarded honours and emoluments on those who competed with success in producing by art cattle possessing certain required qualities and natural marks. It is probable that an Apis period was a cycle of twenty-five Egyptian civil years of 365 days, and that it was established during the second year of the reign of the king in B.C. 5349·44, the competition for oxen taking place in Memphis. The Mnevis period was a cycle of 25 lunar years of 354 days, and will have been established during the third year of the reign of the king in B.C. 5348·117, when the first exhibition of kine was held in Heliopolis. But the Tragian periods were cycles of 25 sacred years of 360 days, the first being established in the seventh year of the reign of the king in B.C. 5342·778, the periodical exhibitions of goats being held in Mendes."

BHORE GHAUT INCLINE.—The Bombay Presidency is cut off from the rest of India by a range of the Syhadree Mountains, a volcanic scarp, which, rising on the Bombay side to the height of 2,100 feet, has no corresponding depression on the other side, simply subsiding gradually into the general level of the country. A railway over these heights has lately been opened. In the course of a journey of less than one hour, and 15¼ miles long, the traveller ascends to a height of 1,832 feet, and the incline is said to be the greatest in the world. In the Bhore Ghaut Railway incline the steepest gradient is 1 in 37, and the lowest 1 in 330, the average being about 1 in 48. There are in all about twenty-six tunnels, the shortest being 29 yards, and the longest 437, and they have been mostly cut in trap rock. The Giovi incline, on the Turin and Genoa Railway, and the Semmering incline, on the Venice and Trieste line, can alone be compared with it, and their dimensions are respectively in length 6 and 13½ miles; in ascents 889 and 1,325 feet; average gradients 1 in 36 and 47; the lengths of tunnelling in the above are respectively, in miles, 2·55, 2·66, and in the Indian line 2·26.

NATIONAL MONUMENT TO SHAKESPEARE.—A member of the Shakespeare Committee suggests Primrose-hill as a site for this monument. He says that for this object the most imposing elevation should be sought—not only in regard to present but to future London, apart, if possible from all other monuments, upon some isolated site, visible at the greatest distance to the greatest number, and that Primrose-hill offers a site 207 feet above the river Thames, recommending itself not alone as the highest base on which to raise a monumental pile, but one that with but slight adaptation could be made to form a grand feature of metropolitan improvement, by uniting the West end with Hampstead. A fine promenade could be formed in a direct line with Regent-street and Portland-place, and could be constructed to the foot of the memorial without violation of public or private rights.

IRON-CLAD SHIPS.—The official reports of the commanders of the "Monitors," made immediately after the failure of the attack upon Fort Sumter in April last, tend to show that these vessels were incapable of resisting the concentrated fire of heavy rifled ordnance. Captain Drayton, of the *Passive*, says:—"1 was struck in quick succession in the lower part of the turret by two heavy shots, which bulged in its plates and beams, and forcing together the rails on which the carriage of the 11-inch gun worked, rendered it wholly useless for the remainder of the action; a little after a very heavy rifle-shot struck the upper edge of the turret, broke all of its eleven plates, and then glancing upwards struck the pilot-house with such force as to send it over, open the plates, and squeeze out the top, exposing the inside of the pilot house, and rendering it extremely likely that the next shot would take off the top entirely." Captain Rogers, of the *Weehawken*, reports:—"Two or three heavy shots struck the side armour near the same place. They so broke the iron that it only remained in splintered fragments, much of which could be picked off by hand, and the wood was exposed. The deck was pierced so as to make a hole, through which water ran into the vessel; 36 bolts were broken in the turret and a great many in the pilot-house. To the *Patapsco* no damage was done which disabled her, although injuries which she received, if multiplied, would do so. Forty bolts in the funnel were broken. After the third shot from the 15-inch gun of the *Nantuck* a port stopper became jammed, several shots striking very near the port and driving in the plating. It was not used again. A number of the same plates were started so much that another shot in the vicinity would have knocked them off. The deck plates were cut in 12 places; one shot cut through the iron, and about two inches into the beam, starting the plates, several bolts, and the planking, for some feet below. The plates on the side armour of the *Nahant* were badly broken in several places, and one, where struck by two shots in close proximity, partly stripped from the wood, and the wood backing broken in, with edging of back plates started up and rolled back in places. The deck was struck twice damagingly, one shot near the propeller wheel quite shattering and tearing the plate in its passage, and starting up 25 bolts, another starting plates and 20 bolts in the turret. There were marks of nine shots; 56 of the bolts were broken perceptibly, the heads flying off inside the turret, and the bolts starting almost their length outside, some of them flying out completely, and being found at a considerable

distance from the turret, on the deck. One shot struck the upper part of the turret, breaking through every plate. The pilot-house was much damaged, and four more such shots as it received would have demolished it. One shot at the base broke every plate through, and evidently nearly penetrated it."

Correspondence.

ON LOCOMOTION BY HYDRAULIC POWER, AND PROPOSALS FOR METROPOLITAN RAILWAYS.

SIR,—As metropolitan railways are now a general subject for discussion will you allow me to bring forward in your columns two propositions which I believe are original, and can be taken for what they are worth either separate or combined. I do not wish to lay claim to what does not belong to me, and would say at once that the scheme brought forward by Messrs. Hawthorn, at the Newcastle meeting of the British Association, suggested to me the plan of propulsion by hydraulic engines that I am about to describe. Their paper was published in your *Journal* (Vol. XI., page 718): they propose to work trains, where locomotives are objectionable (as in underground railways), by fixed steam engines working a continuous series of wheels by endless wire ropes; these wheels to be erected in the centre of each line of rails and about level with the bottoms of the carriages; under the centre of each carriage, extending its whole length, would be a flat bar, which, pressing on these moving wheels, would thus propel the carriage. Important objections presented themselves to me at once, on examining the model shewn at Newcastle, particularly the great amount of friction in working these endless wire ropes, and the enormous loss of power, as all the wheels in connection with each engine would be moving simultaneously, although very few of them (only those actually under the train) would be doing work. Thus, supposing there were a fixed engine at each mile, each engine would have connected with it a mile of wheels, and whenever any of these wheels were in use, the whole mile of wheels would be running simultaneously, the greater part of them having nothing to do but make a noise, as in the first days of the Blackwall railway. It has occurred to me that it would be far better to use hydraulic power to give motion to the wheels, as thus not only an enormous deal of friction would be saved, but also those wheels only actually required would be in motion; each steam engine would thus only have to impart power to move three or four wheels at a time, instead of the whole series connected with it.

This is my first proposal, to have fixed steam engines at convenient distances, whose work would be to pump water into hydraulic accumulators, and it would probably be found best to have several accumulators connected with each steam-engine; this water power under pressure would be conveyed in pipes along the railway; at proper distances wheels, as in Messrs. Hawthorn's plan, must be placed, but instead of wire ropes each set of wheels must have connected with it a small hydraulic engine, or, where two lines of rail were used, it might be placed between the two; the train, while progressing, would turn on and off the water as required, and thus no useless power would be expended.

Not being a practical engineer, I have felt some hesitation in bringing forward this plan, but I have been encouraged to do so by some engineers, among whom are men whose names would command attention and respect.

It has occurred to me that, possibly, this plan may be more practicable and economical than the atmospheric railway, and thus be capable of more general extension than merely where locomotives are ineligible; this I must leave to the verdict of practical men.

My second proposal depends, to some extent, on my first. It is nothing new to propose railways running by the sides of the streets, about the level of the first floor windows. Some years since the *Illustrated London News* published views of some fine (proposed) streets in London with such railways, but as yet no such plan has been carried out. It has, however, occurred to me that, supposing by the means I have just described, or by some other plan, trains can be propelled without being preceded by heavy locomotives, railways for passengers might with perfect safety be made much lighter, and for town-passenger traffic a narrower than the present English narrow gauge might be used. In some places—for instance, South America—I have understood that a much narrower gauge is in operation. This can be done with more safety where it is proposed, as in this case, to adopt precautions for keeping the carriages on the line. In the proposal before alluded to, it was suggested to have a railway each side of the street, supported on something similar to the original arcades in the Quadrant, but this would considerably contract the street and darken the houses. I propose to carry, through certain wide streets, railways contained in and on tubular viaducts, with open latticed sides and bottoms, so as not to obstruct the light and air; these tubular viaducts to be supported on iron arches, one pillar of these arches to be in a line with the curb-stones of the street pavement, and the other against the houses; the tubular viaduct would project a little over the outside pillar, and only containing one narrow line of rails, there would be some considerable space between it and the houses. There would thus be no obstruction either to the foot or carriage traffic, and very slight obstruction to the light and air; one line of rail would be inside the tube and one on the top; of course at the termini arrangements would be made for the transfer of the carriages from one line to the other. The only prominent objection to this plan of constructing railways would be the obstruction to the view, but as the proposal contemplates chiefly suburban railways, to a great extent they would be in roads where gardens are in front of the houses, and when approaching business quarters, the open lattice iron work, which would be some feet from the windows, could certainly be made as agreeable to the eye as the dingy show of bricks and windows on the opposite side of the street. As an instance where such a railway might be eligible, there is a very large omnibus traffic from Camden Town to Oxford-street, where High-street and Tottenham-court-road are business thoroughfares, and such a viaduct would certainly not mar the prospect from the first floor windows. Nearly the whole of the rest of this line the railroad would be a considerable distance from the houses, and in one direction for some distance the hydraulic engines might be dispensed with, as the incline would be sufficient for the train to proceed by itself.

There are some collateral and very important uses to which these viaducts might be usefully applied; the pneumatic dispatch scheme is no doubt a success, the only difficulty is in laying the tubes under some of the streets. Tubes for the purpose could be carried on or under these viaducts with little additional expense, and should the hydraulic plan be adopted, in the case of fires there would always be at hand a supply of water under pressure with ample steam-power at command, which might thus supersede fire-engines everywhere within easy reach of such railways.—I am, &c.,

W. SYMONS.

17, St. Mark's-crescent, Regent's-park, N.W.

ART-WORKMEN AND THE ROYAL ACADEMY.

SIR,—At the outset of my remarks, I feel greatly puzzled in adopting the modern nomenclature of art, we having, within the last twenty years, taken from the Teutonic so many compound words that not alone confound artists but mistify the masses, who hear of "High-art," "Pure art," "Practical art," "Art-manufactures," and "Art-workmen," as if all art was not "high," "pure," or "practical," and every artist not an art-workman. However, as "word-painting" is a popular produce, a sign of the times, we must take it for what it means rather than what it says.

Germany, certainly, is full of skilled artisans or "art-workmen," capable of carrying out ideas and re-producing forms of a more sterling quality than perhaps those of France, though not with that elegant *abandon*, dash, or appreciation of colour, so common in the productions of their Gallic neighbours (which for certain qualities will always bear the palm), though it is remarkable how choice wares from Austria and Prussia are making their way in various markets, and principally from the taste displayed in their construction or ornamentation.

Now, though it is of the greatest importance that artizans should receive aid in art-education, it seems strange that the Royal Academy Commission should seriously have advised a plan for connecting them with that institution, when the State has an organisation well adapted to the purpose, and quite capable of carrying it out, by means of the local Schools of Art and their officers.

In their laudable wish to do justice in the broad field of art, the Royal Commission have shown over-zeal for a department hardly within their province, and one being worked out by the Society of Arts, who in a late exhibition of competitive examples of art-workmanship, have fully demonstrated a great national want—a want that should be worked out in the great seats of manufacture, and that by the Department of Science and Art.

Let the Royal Academy by all means extend its influence and fostering care to every department of creative art; let it do all it can for the artist, encouraging him to bestow his genius upon everything, for the higher the power the more universal will the range become; whilst dreaming of the substance do not forget the atoms of which it is composed. All that regards Art in its creative sense appertains to an academy, and every method by which it may be perpetuated—engraving, die-sinking, and enamel painting, being the chief of these. The tardy justice paid by painters to the means by which their popularity could be made patent to the world, is a fact no stranger can comprehend, foreigners well knowing that if a man capable of ennobling a higher walk by his works, descends to a lower (or a different one) he becomes a benefactor, and, as one of a corporation, deserves the highest honours it can bestow.

Upon perusing "the instrument" or document of foundation of the Royal Academy of Arts, in 1768, one cannot but feel that its compilers, had they lived in 1868, would have been as liberal as they were enlightened a century ago, when taste, if it had not sunk to its lowest, was gradually descending; by taste I allude to the effect of Art upon the manners of the nation, which then was to be counted as little, style being nowhere.

When the promoters of the Royal Academy first worked, the Elgin Marbles were in Athens, and other collections now in the British Museum unknown; the monuments of Egypt, Greece, and Rome were unmeasured and unfigured, Nineveh and Pompeii lying buried beneath heaps of ashes, the glories of mediæval-art being, in derision, voted "Gothic;" archæology had little to do with historical painting, nor was geology thought of with regard to landscape, or the glorious forms and colours in Eastern Art ever dreamed of; electricity had not given us the electrotype, nor had lithographic stones been quarried; xylography was not revived, whilst photography, the last great inheritance for Art, was deep in the future; and as to International Exhibitions in palaces of glass, they only existed in the imagery of poets.

Earnestly is it to be hoped that the Royal Academy of Arts will not forget its high mission, for assuredly in seeking to do good to Art and artists, it will confer great benefits upon itself. The Society of Arts (an older institution and pioneer in the field) some twenty years since awakened from the lethargy of a century; the good it has effected needs no record here, for it is world-wide.

I am, &c., JOHN LEIGHTON.

ERRATUM.—In last number, p. 114, col. 2, line 5 from bottom, for "flax" read "wool."

MEETINGS FOR THE ENSUING WEEK.

MON. ...R. Geographical, 8½. 1. Capt. Edwin Austin, "Mustakh Glacier." 2. Mr. E. H. Hargraves, "Report on the non-auriferous Character of West Australia."
Medical, 8½. 1. Dr. Palfrey, "A Case of Uterine Polypus, unaccompanied by Hæmorrhage." 2. Mr. W. Miller, "On two peculiar Properties of Chloroform, independent of Anæsthesia." 3. Dr. Habershon, "Abscess of the Liver."

TUES. ...Syro-Egyptian, 7½. Mr. Samuel Sharpe, "Manetho's Lists of Kings explained by the help of Eratosthenes and the Tables of Abydos."
Ethnological, 8. 1. Rev. G. R. Hall, "On the British God Mogon and the Religion of the Northumbrian Celts." 2. Mr. C. R. Markham, "On the Tribes inhabiting the Valley of the Amazons and its Tributaries."
Civil Engineers, 8. 1. Mr. J. R. McClean, President, "Address." 2. Mr. J. M. Heppel, "On the Closing of Reclamation Banks."
Statistical, 8.
Zoological, 9.

WED. ...Microscopical, 8.
British Archæological Assoc., 8½. 1. Mr. Wentworth, "On Wakefield and Sandal Castle." 2. Rev. E. Kell, "On the Site of Ancient Southampton." 3. Mr. Syer Cuming, "On the History of Slings."

THUR. ...Antiquaries, 8.
Linnæan, 8.
Royal, 8½.
R. Society Club, 6.

FRI.....Philological, 8.

Patents.

From Commissioners of Patents Journal, January 1st.

(Agriculture) harrows, ploughs, &c.—3223—J. Green.
Batteries—3249—J. Mathew.
Bayonet blades, &c., forging and tempering—3251—G. T. Bousfield.
Breech-loading fire-arms—3185—R. Marrison.
Brick machinery—3199—H. Clayton.
Cabs, &c.—3245—R. Walter.
Candles, fixing upright—3247—W. E. Gedge.
Cases for jewels, &c.—3187—C. Jeffreys.
Envelopes, &c.—3227—J. L. Wittenberg.
Forge hammers—3189—J. Astbury.
Fulling machinery—3149—G. T. Bousfield.
Hops, training—3205—F. W. Collins.
Horses, method of stopping—2900—A. B. Florest.
Iron and steel manufacture—3213—W. H. Tooth.
Iron welded chain, &c., manufacture of—3217—E. Tangye.
Looms—3203—T. Goldie.
Looms—3241—A. Turner.
Looms—3255—W. Holland.
Lozenge manufacture—3155—S. and T. Smith.
Oil for mixing paints, &c.—3207—G. Haseltine.
Perforating machines—2496—J. Heap.
Petroleum, &c., stills for—2899—A. G. Southby.
Pumps—3237—F. Hazeldine.
Rag machine cylinder—3113—A. Reid and G. Rydill.
Railway trains, communication between guard and engine driver—3235—J. G. Rowe.
Railways, atmospheric—3191—A. Alison and J. Halliwell.
Screw propeller—3121—W. Livingstone.
Ships, propelling and steering—2780—A. A. L. P. Cochrane.
Smoking pipes—2622—A. Wardle and J. Brindley.
Spring mattresses—3229—V. B. FitzGibbon.
Steam engines—3219—R. Paterson.
Stockings, darning, &c.—3221—R. Baynes.
Surface condensers—2566—W. Snell.

From Commissioners of Patents Journal, January 5th.

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

3193. B. N. de Buffon.
3. M. Henry.
107. J. H. Johnson.
85. W. G. Woodcock.
20. T. Cobley.
14. W. C. Fuller, J. A. Jaques, and J. A. Fanshawe.
25. A. Fairbairn.
84. A. M. Foote.
184. J. Deakin and J. Cresswell.
18. S. Perkes.

PATENTS ON WHICH THE STAMP DUTY OF £100 HAS BEEN PAID.

3089. T. Alden.
284. J. Owen.
3102. W. Bray.
12. J. Fowler, jun.
3. W. Rigby.